

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of) **RM-11305**
Amendment of Part 97 of the Commission's)
Rules To Implement the Basis for Bandwidth)
Based Bandplanning)

Via the ECFS

Comments of The **Society for the Preservation of Amateur Radio** on RM-11305

I. Introduction

1. The Society for the Preservation of Amateur Radio (SPAR) is a non-partisan group of concerned amateur radio operators working together to ensure the vitality of the Amateur Radio Service as defined in the US Legal Code 47 CFR Part 97, especially the purposes embodied in 97.1. It is our belief that the technical nature of the Amateur Radio Service is clearly acknowledged in the US by the FCC, particularly in Part 97.1, items (b), (c) and (d), which comprise 3 of the 5 reasons for the establishment of the Service.
2. We acknowledge the proud history of technical and non-technical contributions that amateur radio operators have made to radio communications technology and strive to ensure the Amateur Radio Service preserves traditional operating modes and remains able to continue to meet the technical challenges of the future.
3. We believe failure to require adequate entry-level skills will lead to chaos on the amateur bands, which are an internationally shared resource, and that inadequate enforcement of the regulations governing amateur radio will render the service useless and drive away those persons who could most contribute to the "advancement of the radio art."
4. We believe it essential for the survival of the Amateur Radio Service that continuous advancement in "skills in both the communications and technical phase of the [radio] art" be encouraged.

5. We believe the Amateur Radio Service should be open to all interested persons. Due to the inherently technical nature of amateur radio communications, it is important to ensure that amateur radio operators possess at least minimum skills and that the regulations concerning the Amateur Radio Service must encourage the further development of "trained operators, technicians, and electronics experts."

6. We further believe that, due to the inherent nature of amateur radio, technical skills contribute directly to the "value of the amateur service to the public" and the "amateur's unique ability to enhance international goodwill."

II. Discussion

7. The members of SPAR believe that the adoption of RM-11305 would not be in the best interest of Amateur Radio. Generally, RM-11305 relies on the good behavior of Amateurs as the only way to ensure different modes can operate together without interference. In reality, in countries where bandwidth bandplanning is in place, participants are reporting problems with interference between modes using different modulation schemes, and with Amateurs refusing to honor the plan boundaries:

*General Conference, Davos, 11 to 16 September 2005, IARU Region 1 HF Bandplan Principles from the "Key points and proposal" section: "The HF bandplanning basis, on which the current IARU Region 1 HF bandplan is based, accepts CW QSO's across all bands, except within CW beacon segments. Experience shows that telephony and digital modes cannot share the same segments, and should be assigned separate segments in the HF band plan. **The establishment of all mode segments, mixing analog and digital modes, should be avoided** because of mutual interference. Digitized speech should be considered a digital mode in bandplan matters, because such a mode is transmitting digital signals determined by a digital protocol (recommended by the IARU Region 1 Interim Meeting 2004)."*

*From the RSGB, Improving Bandplan Compliance, paper number 138: "An increasing proportion of the Amateur Radio community is using non-CW modes and deploying beacons within the CW communication sub-bands. National societies could do more to improve compliance with IARU bandplans. Note: The authors believe that the degree of compliance within the CW sub-bands in particular is indicative of the respect for IARU bandplans in general. The IARU Region 1 HF Bandplan has served the amateur community very well for many years, and has always been made available by the IARU member societies through a range of printed publications and internet resources. However, **in recent years, it has been observed that an increasing number of Amateur Radio operators can be heard operating data and telephony modes as well as beacons that transmit position and propagation data within the CW communication***

subbands. Non-Morse stations within the CW sub-bands are getting more aggressive and more confident, believing that they are "entitled" to do what they do.

From the Conclusions section: "That each national society (or, initially, a small 'pilot' group of national societies) work together to develop common and consistent methods for bandplan compliance by logging incidents of non-compliance within their national borders; producing regular reports that summarise the non-compliances."

8. Clearly these quotes show that bandwidth based bandplanning is in its infancy and that the concept may be flawed based on incorrect basic assumptions concerning the ability of world amateurs to follow "gentleman's agreements", the ability of modes to co-exist, and the need for wildly expanded digital use.

9. In fact, in an article in the December 2005 edition of CQ Magazine, columnist Don Rotolo (N2IRZ) states:

...a flat bandwidth maximum of 3.5kHz is proposed (with an exception for AM), raising quite a ruckus in the digital community. . . Considering the service that the emergency response community wants and needs, which is a relatively fast data channel than can span one to three hundred miles, such a narrow bandwidth does not meet the need.

Mr. Rotolo also went on to arrive at a thumbnail estimate of the need for 25kHz spectrum chunks for his applications.

10. A credible "rule of thumb" verified by tests in the Cellular Industry show that users over an RF link can expect an average of 2.0bps of throughput per 1Hz of spectrum. Based on this number, bit rates can be predicted and practical use ascertained:

100Hz = 200bps	Good for Text Typing
500hz = 1.0kbps	Fast Text, Email Transfer, Text Files
2.5kHz = 5.0kbps	Email, slow binary file transfer, Text
25khz = 50.0kbps	Data service that rivals "dial-up" at about 28.8kbps
150kHz = 128kbps	(Icom D-Star/ID-1 Specifications) Rivals Cellular Data, passable Internet Interconnect.
200kHz = 400kbps	Rivals Cellular data rates, Internet Interconnect.

This data clearly shows that estimates of needed bandwidth by the digital community are grossly understated where they desire data rates that rival commercial services.

11. The CTT petition RM-11305 puts no limits on proposed bandwidth for Amateur emissions provided the transmission does not interfere with an ongoing conversation or data use. This opens up the possibility that a data signal greater than 200kHz would be legal under the plan. Clearly magazine articles like the one quoted above and direct statements by digital enthusiasts on Internet reflectors indicate that there would be those ready to use wide bandwidths immediately.

12. The Commission has long established spectral efficiency in the Amateur service to mean the number of simultaneous users that may occupy the frequencies at any time. SPAR agrees that the goal is for as many amateurs to have use of spectrum as possible at one time. So regardless the clear spectrum when a 200kHz data signal might begin, it would occupy enough bandwidth to make use by other Amateurs impossible. Clearly the goal of the rules is not to allow one or two users to occupy the entire band at the expense of hundreds of potential users.

13. Even if CTT members would disagree with the numbers presented herein, no credible study has been done on the issue. In fact, bandwidth bandplanning is in its infancy and bears further study before implementation as a plan that would potentially affect hundreds of thousands of U.S. Amateurs. For these reasons we ask the RM-11305 be denied.

14. SPAR strongly suggests that if bandwidth bandplanning is not working in other countries where there are limited number of Amateurs, it would be unreasonable to expect that it could work in the U.S. based solely on the behavior of many, many more participants.

15. The members of SPAR are continually concerned about the potential for digital software like WinLink to compete with commercial services in violation of Commission rules. WinLink software allows the sending and delivery of email via Amateur HF frequencies for boaters, users of recreational vehicles, and world wide organizations with the need to communicate. These services are also supplied by commercial competitors including, Iridium, OrbComm, Globe Wireless, PinOak Digital, SeaWave, Kiel Radio, Bern Radio, SailMail, BushMail, CruiseEmail and Monaco Radio just to name a few. In a November 2003 article which appeared in Cruising World Magazine, the following quote appeared:

"Steve Waterman (K4CJX), one of the many folks who operates a station free of charge to the ham community, claims that there's no commercial HF radio email system faster or more reliable than WinLink"

16. Mr. Waterman is one of the developers of WinLink and the quote clearly shows the intent to bypass commercial interests and offer WinLink to customers otherwise eligible for commercial service as covered in Part 97.113 (a)(5). To the members of SPAR, this spotlights the need for clarification of FCC Rules concerning this practice before ruling on any petition which might encourage more digital use. To the extent that RM-11305 makes the commercial use of Amateur Radio spectrum easier, we ask that it be denied.

17. In reading the comments posted on the ECFS, many Amateurs are expressing their concern for traditional modes such as AM and CW. There is little doubt in our minds that new users coming to Amateur Radio by virtue of changes proposed by the Commission in NPRM 05-235 will use SSB, the most popular mode. This will cause a great number of Amateurs to spread out into all available spectrum making the use of AM and CW difficult at best. Surely there would be little in the way of "quiet enjoyment" for any mode in this situation, leading to increased FCC complaints and requiring more action to maintain order.

18. RM-11306 proposes to mix digital signals and analog voice signals in the current voice bands. All evidence from other industries (like the Cellular Telephone Industry) points to a need to segregate digital and analog modes. Information gleaned from past use under current rules is as ineffective as were the lab tests by cellular carriers in showing the ability of modes to coexist. In practice (under band loading), the cellular carriers found that for most modes the best solution was segregation. Likewise, higher occupancy rates of digital modes mean greater spacing is needed between transmissions resulting in less 3.5kHz signals on HF frequencies than is experienced today.

19. Due to Amateur Radio spectral path loss and propagation variations, it is well known that several SSB conversations can occupy the same frequency at the same time. How many conversations can be involved in this "propagation stacking" is dependent upon several factors. Regardless, a human can distinguish between several SSB conversations operating at different dynamic levels. Conversely, if two digital signals exist on the same frequency most digital programs will copy the stronger of the two signals or one signal at a time, but not both. In the case of two signals of similar strength, intermixing of the two digital streams is seen by digital software as interference.

20. In the case of different modes, interference between modes (such as SSB and PSK31) will be a determining factor for the spectral efficiency of each type of signal. As an example, it is known that PSK31 cannot exist with a SSB signal in the 350 to 800hz (audio) area of the SSB signal

because there is too much power in the SSB signal resulting degradation in the PSK31 received data stream while the Amateur using SSB is speaking. Likewise, PSK31 signals pose interference problems to the SSB operator and can impact the intelligibility of the SSB signal in the 1500hz or 2000hz (audio) range because that area of the SSB signal carries a significant part of mode intelligibility.

III Conclusion

21. SPAR believes that for these reasons, any request beyond current regulations to allow digital signals to share common spectrum with analog voice modes (or CW) as requested by this (or any) petition that may come before the Commission should be denied.

Respectfully,

Filed on behalf of the nearly 500 members of SPAR,
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